AMENDED CLAIMS
[received by the International Bureau on 29 June 2005 (29.06.2005); original Claims 1-71 replaced by amended claims 1-71

1. A method comprising:

accumulating an opaque material on a region of a microfluidic chamber;

exposing the region to light; and

determining the transmission of light through the opaque material.

2. The method of claim 1 wherein the opaque material comprises a metal.

3. The method of claim 1 wherein determining the transmission of light includes observing the opaque material with an unaided eye.

4. The method of claim 1 wherein the opaque material has a dimension of at least 100 microns.

5. The method of claim 1 comprising exposing the opaque material to light of a first wavelength and detecting transmission of light of the first wavelength.

6. The method of claim 2 wherein the metal comprises silver.

7. The method of claim 2 wherein the opaque material is formed by electroless deposition.

8. The method of claim 7 wherein the opaque material is electrolessly deposited on a metal colloid.

9. The method of claim 8 wherein the metal colloid comprises a gold-conjugated antibody.

10. The method of claim 5 wherein the light is pulse modulated.

11. The method of claim 1 wherein the opaque material is deposited over a region having a dimension of at least 10 microns.

12. The method of claim 1 wherein the transmittance is determined in the absence of a photomultiplier.

13. The method of claim 1 wherein the transmittance is determined in the absence of a wavelength selector.

14. The method of claim 1 wherein the transmittance is determined in the absence of a columnator.

15. The method of claim 1 wherein the determining step is performed in the absence of line voltage.

16. The method of claim 1 wherein determining the transmission of light comprises passing light through an optical sample path having a length less than 1 mm.

17. The method of claim 16 wherein the optical sample path length is less than 100 microns.

18. The method of claim 16 wherein the optical sample path length is less than 50 microns.

19. An immunoassay comprising:

a microfluidic chamber having a surface;

at least one of an antigen or an antibody disposed on a portion of the chamber surface; and

an opaque layer associated with the portion of the chamber.

20. The immunoassay of claim 19 wherein the layer is opaque at a wavelength for which the microfluidic chamber is transparent.

21. The immunoassay of claim 19 wherein the opaque layer comprises a metal.

22. The immunoassay of claim 19 further comprising a layer including a metal colloid.

23. The immunoassay of claim 19 comprising a plurality of microfluidic chambers.

24. The immunoassay of claim 21 wherein the metal comprises silver.

25. The immunoassay of claim 22 wherein the metal colloid comprises a gold-conjugated antibody.

26. A method comprising:

passing a fluid sample over a surface;

allowing a sample component to bind with a binding partner disposed on the surface;

after allowing the sample component to bind with the binding partner disposed on the surface, allowing a metal colloid to associate with a sample component; and

flowing a metal solution over the surface to form a metallic layer.

27. The method of claim 26 wherein the metal colloid associates with a bound sample component.

28. The method of claim 26 wherein the metal colloid comprises gold.

29. The method of claim 27 wherein the metal colloid comprises a gold-conjugated antibody.

30. The method of claim 26 wherein the metallic layer is silver.

30. The method of claim 26 wherein the metallic layer is silver.

31. The method of claim 26 wherein the metal solution is a silver solution.

32. The method of claim 26 wherein the metal solution is laminarly flowed over the surface.

33. The method of claim 26 wherein the surface is a portion of a microfluidic channel.

34. The method of claim 26 wherein the sample component is one of an antigen and an antibody and the binding partner is the other of the antigen and the antibody.

35. The method of claim 26 further comprising determining the opacity of the metal layer.

36. The method of claim 35 wherein determining comprises examining the metal layer with an unaided eye.

37. The method of claim 35 wherein determining comprises irradiating the metal layer with light and measuring light transmittance.

38. The method of claim 37 wherein the light is measured at the same wavelength at which it is transmitted.

39. The method of claim 26 further comprising measuring the conductivity of the metal layer.

40. The method of claim 26 wherein the fluid is passed over a plurality of surfaces.

41. The method of claim 40 wherein each of the plurality of surfaces is associated with a different binding partner.

42. The method of claim 26 further comprising detecting the concentration of metal in the metal solution after flowing the metal solution over the surface.

43. The method of claim 26 wherein the sample has been obtained non-invasively.

44. The method of claim 43 wherein the sample comprises saliva.

45. A method comprising:

flowing a fluid sample over a surface of a microfluidic channel;

allowing a sample component to bind with a binding partner disposed on the surface of the microfluidic channel; and

accumulating an opaque material on a portion of the surface of the microfluidic channel.

46. The method of claim 45 further comprising determining the opacity of the opaque material.

47. The method of claim 46 wherein determining comprises examining the opaque material with an unaided eye.

48. The method of claim 46 wherein determining comprises irradiating the opaque material with light and measuring light transmittance.

49. The method of claim 48 wherein the light is measured at the same wavelength at which it is transmitted.

50. The method of claim 45 wherein the surface is a portion of a microfluidic channel.

51. The method of claim 45 wherein the sample component is one of an antigen and an antibody and the binding partner is the other of the antigen and the antibody.

52. The method of claim 45 wherein the fluid is passed over a plurality of surfaces.

53. The method of claim 52 wherein each of the plurality of surfaces is associated with a different binding partner.

54. The method of claim 45 wherein the sample has been obtained non-invasively.

55. The method of claim 54 wherein the sample comprises saliva.

56. An assay kit comprising:

a surface including a microfluidic channel;

at least one of an antibody or an antigen associated with a portion of the microfluidic channel;

a metal colloid associated with an antibody or an antigen;

a metal precursor; and

instructions for performing the assay.

57. The kit of claim 56 wherein the metal precursor comprises a silver salt solution.

58. A method comprising:

contacting a sample with an antibody or an antigen;

allowing a sample component to bind with the antibody or antigen;

illuminating any bound sample component with a pulse modulated light; and

determining binding of a sample component to an antigen or antibody.

59. The method of claim 58 wherein the bound sample component associates with a light sensitive moiety.

60. The method of claim 58 wherein the bound sample component associates with a metal colloid.

61. The method of claim 58 wherein the sample component is an antibody or an antigen.

62. The method of claim 58 wherein determining comprises detecting transmission of pulse modulated light.

63. The method of claim 58 wherein the antibody or antigen is bound to a surface.

64. The method of claim 63 wherein the surface comprises a portion of a microfluidic channel.

65. The method of claim 63 further comprising forming an opaque layer on the surface.

66. The method of claim 65 wherein the opaque layer comprises a metal.

67. The method of claim 66 wherein the opaque layer is electrolessly deposited on the surface.

68. The method of claim 67 wherein the opaque layer is deposited on a gold-conjugated antibody.

69. The method of claim 58 wherein the pulse modulated light passes through a sample having an optical path length less than 1 mm.

70. The method of claim 58 wherein the pulse modulated light passes through a sample having an optical path length less than 100 microns.

71. The method of claim 58 wherein the pulse modulated light passes through a sample having an optical path length less than 50 microns.